M. Wheeler, Corps of Engineers, for 1879, contains an ornithological report on observations and collections made in portions of California, Nevada and Oregon, by Assistant H. W. Henshaw. Mr. Henshaw is now in Oregon and Washington Territory, taking the census of the Indian reservations in that region, but will doubtless find opportunities for ornithological studies in that interesting section.——Under the heading "Infusoria as parasites," Mr. W. S. Kent, in the *Popular Science Review*, enumerates ten species of *Flagellata* and fifteen species of *Ciliata* which are genuine parasites in the viscera of birds, frogs, &c., ducks and geese, house-fly, the blood of Indian rats, a nematode worm, the common cockroach, a myriopod (Julus), a water beetle, earthworm, a marine planarian of several fresh water snails, besides Dr. Salisbury's *Asthmatos ciliaris*, which he regards as an active agent in the production of one form of hay asthma or hay fever.——In a recent paper in *Kosmos*, Fritz Müller describes a Brazilian fly *(Paltostoma torrentium)* with two forms of females.

ENTOMOLOGY.[1]

Larval Habits of Bee-flies (Bombyliidæ).—In the last number of the *American Entomologist*, we gave from advance sheets of the Second Report of the United States Entomological Commission an account of the larval habits of Systœchus and Triodites, showing that they prey on locust eggs, and drawing the following conclusions:

The discovery of the "parasitism" of these bee-flies upon locust-eggs at once suggests a comparison with the similar diversity of parasitic habits among the Meloidæ as given in our first report, some of them infesting bee-cells, while others, as the true blister-beetles (Lyttini), feed on locust eggs.

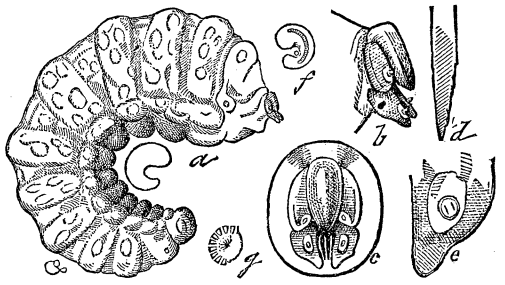

Fig. 1.—*Systœchus oreas; a*, larva; *b*, head, from side; *c*, do., from front, partly withdrawn into first joint; *d*, left mandible; *e*, left maxilla; *f*, prothoracic spiracle; *g*, anal spiracle (after Riley).

The Anthracids are now united by the best authorities with the Bombyliidæ, of which family as a whole Osten Sacken has said, they are "perhaps the most characteristic and one of the most abundantly represented families of Diptera in the western region, including California." The abundance of blister-beetles is also well known to characterize this region, and we have shown how this abundance is connected with the abundance of locusts. It is

[1] This department is edited by Prof. C. V. Riley, Washington, D. C., to whom communications, books for notice, etc., should be sent.

of interest, therefore, to find that the bee-flies bear a similar relationship of parasitism to the latter, and that the characterization of the fauna in these two groups is really dependent upon the presence of the locusts as well as upon the rich representation of the burrowing Hymenoptera.

FIG. 2.—*Systœchus oreas;* pupa (after Riley).

Reviewing what had been published as to the larval habits of the true Bombyliids, we concluded that while there was strong presumptive evidence that they preyed on bee larvæ, there was yet no proof, and that the locust-egg-feeding habit we recorded, weakened the presumption. Since the publication of our article we have met with one previously overlooked, "On the Economy, etc., of Bombylius," by T. A. Chapman, M.D., in the *Entomologists' Monthly Magazine* for February, 1878 (Vol. XIV), p. 196. Mr. Chapman gives abundant proof of the parasitism of the European, *B. major*, on *Andrena labialis*. He records some observations on the oviposition of Bombylius, the small white egg being thrown with a short jerk against the earth near where the food of its future larva presumably occurred. This would also imply that, as in the case of the blister-beetles, the newly hatched larva must seek its food, and strengthens our suspicion that it will be found to be much more active than the mature larva. Mr. Chapman very fully describes the mature larva and the pupa, and his descriptions show that in all essential points the larva of Bombylius accords with those of Triodites and Systœchus. We quote his description of the head: "The head is set into this segment [the 1st thoracic] and is retractile; it is very small; its center is occupied by a prominent wedge-shaped portion, the point of the wedge being downwards, and immediately in front of the mouth. Immediately beneath this are two black, very sharp, setiform jaws (?); on each side is a papillary eminence (antenna?) of three joints set in a circle of softer tegument, and immediately below project downward on each side two large palpi (labrum?) looking like jaws, but having a vertical, not a lateral mobility, on the anterior face of each of these there is a palpus of some length, apparently unjointed, set in a circle." It will thus be seen that he homologizes the parts

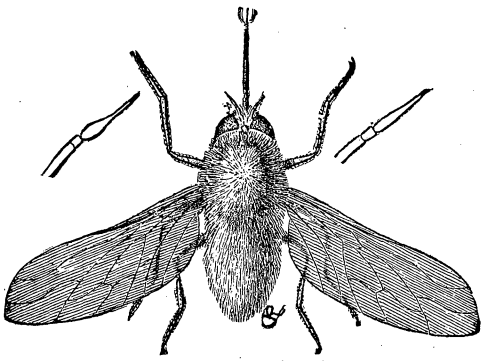

FIG. 3.—*Systœchus oreas;* female; antenna, side view, to left; do. top view, to right.

much as we have done, except that he refers the two lower palpigerous pieces, with a question, to the labrum (misprint for labium?) which they cannot possibly be; they are evidently the maxillæ. The upper lateral pieces bearing the antennæ are much less conspicuous, judging from the description, in Bombylius than in Systœchus. The pupa of Bombylius, from Dr. Chapman's excellent description, differs in the greater prominence and somewhat different arrangement of the cephalic spines, the anterior pair being stouter and more bent forward than in either of the genera we have treated of. Dr. Chapman speaks of these spines forcibly reminding him of the tusks of a walrus and of their admirable adaptation to tearing down the clay stopping and digging through as "with mattock and shovel" the long burrows of the bee upon which it preys. The dorsal and anal spines are also much more prominent than in our locust-egg parasites. The pupa of Systœchus and Triodites, not being under the necessity of such strenuous digging, have a less formidable armature; otherwise there is strict structural correspondence with Bombylius.—*C. V. Riley.*

Experiments with Pyrethrum: Safe Remedies for Cabbage Worms and Potato-Beetles.—The following experiments with Pyrethrum were made, at our request, by Prof. A. J. Cook, of the Michigan Agricultural College, at Lansing. They are interesting as confirming all that we have hitherto said in recommendation of this powder for the imported cabbage worm, no safe and satisfactory remedy for which had been discovered before we recommended this powder and showed that it could be economically used when simply mixed with water. Its value, used in this way, for the Colorado potato-beetle as a substitute for the more dangerous arsenical compounds will at once be appreciated.—*C. V. R.*

Sept. 27, 1880.—I placed ten cabbage caterpillars (*Pieris rapæ* Schrank), in each of two small wooden boxes which were covered with wire gauze. In one box I dusted the least possible amount of Pyrethrum mixed with flower in the proportion of one part of the Pyrethrum to twenty parts of the flour. I sprayed those in the other box with a liquid mixture, using one tablespoonful of Pyrethrum (7 grammes $\frac{1}{60}$ lb) to twenty gallons of water. In five minutes all the larvæ were on their backs. Nor did any of them recover. A large number of the caterpillars on the cabbage plants were sprinkled or dusted with the Pyrethrum, the proportion the same as given above. In one hour the plants were examined and in every case the caterpillars were found dead.

The same experiments as those detailed above were tried with the potato-beetle (*Doryphora 10-lineata*). Those in the boxes were all down in fifteen minutes, both beetles and larvæ; nor did they recover. I watched those on the vines for twenty minutes, when several had fallen to the ground. These were some distance

from my home, and I could not watch them longer. Whether all dropped or not I am not able to say, nor whether all or any recovered.

Wednesday, Sept. 29, 1880.—In the following experiments the cabbages were simply dusted or sprinkled with no effort to secure actual contact of the liquid or powder with the larvæ. The experiments were tried under my direction by a very trusty and careful assistant, Mr. Will. R. Hubbert, with the following results:

1st Experiment.—By use of a common sprinkler, nine cabbages were treated with the liquid mixture, composed of one tablespoonful of Pyrethrum (7 grammes) to a gallon of water. In one and one-half hours after the application, a *hasty* examination discovered thirteen dead larvæ and three live ones.

2d Experiment.—Ten cabbages were treated the same as above, except that two applications of the liquid were made; nineteen dead larvæ and one live one were found.

3d Experiment.—Twenty-six cabbages were treated with a liquid mixture of one tablespoonful of the powder to two gallons of water. One application was made with Whitman's Fountain Pump. Eleven dead and four live larvæ were found.

4th Experiment.—The same as experiment 3, on thirteen cabbages, except that two applications of the liquid were made. There were five dead caterpillars and two alive.

5th Experiment.—Twenty cabbages were dusted with a powder compound of one part of Pyrethrum to forty of flour; five dead larvæ and one live one were found.

6th Experiment.—Twenty cabbages were treated the same as No. 5, except that the mixture was in the proportion of 1 to 20; three dead and three live caterpillars were found.

The examinations in all the above cases were made one and one-half hours after the application of the liquid. The examination was too hasty to be thorough.

The next day all were again examined with great care, so that very few, if any larvæ were omitted in the count.

No. 1.	9	Cabbages,	17	dead,	39	stupefied,	3 alive.
" 2.	10	"	42	"	30	"	1 "
" 3.	26	"	18	"	0	"	58 "
" 4.	13	"	25	"	3	"	1 "
" 5.	20	"	18	"	3	"	9 "
" 6.	20	"	9	"	0	"	1 "

Friday, Oct. 1, 1880. *Experiment 1.*—Treated twelve cabbages: used one gallon water and ½ spoonful of Pyrethrum. Careful examination revealed eleven dead and eleven alive.

Experiment 2.—Twelve cabbages: used one gallon water to ¼ spoonful (2 grammes) of the powder. Eleven dead and four alive.

Experiment 3.—Twenty-six cabbages: used Pyrethrum and flour 1 to 40. Three dead, five alive and one stupefied.

Experiment 4.—Twelve cabbages: one gallon water to one spoonful of the powder. Result, thirteen dead, four alive and four stupefied.

The above experiments show conclusively that this powder is fatal to the caterpillars, and that too in very dilute liquid mixtures, as only $\frac{1}{200}$ of a lb. to the gallon of water was used in Exp. 2 of Oct. 1st, and eleven larvæ were killed. We have only to sprinkle it on to the plants, though it may be necessary to make more than one application to insure complete success. The success was better with the liquid than with the flour mixture, and can be applied with greater speed and economy.

A twig of alder *(Alnus serrulata)*, covered beneath with wooly Aphides *(Eriosoma tessellatum* Fitch), was dipped into the liquid mixture of $\frac{1}{50}$ lb. to a gallon of water. The next morning all the lice had fallen to the ground, never to rise again.

Flies and mosquitoes in a room where the powdered Pyrethrum had been blown in not very large quantities, less than $\frac{1}{100}$ of a lb. to a room twelve feet square, were felled to the floor, where nearly all remained till morning; though the application was made the night before. If not swept up some of the flies would recover. The flies commence to fall in ten minutes.

Squash bugs *(Coreus tristis)*, were kept in the clear powder, in a close tin box, for three days, and were still alive. I also sprinkled and dusted these insects on the vine, and could see no signs of success in killing them.

THE FOOD OF FISHES.—We have received an interesting contribution, with the above title, by Prof. S. A. Forbes, from Bulletin No. 3, Illinois State Laboratory of Natural History, November, 1880. The author gives the results of a large series of examinations of the stomachs of darters, perches, bass and sunfishes. He also separately considers the food of the young fishes as distinguished from that of the adult. His investigations have led to some interesting general conclusions, among which we commend the following as applying to studies in other departments of Natural History as well: "Nowhere can one see more clearly illustrated what may be called the *sensibility* of such an organic complex—expressed by the fact that whatever affects any species belonging to it, must speedily have its influence of some sort upon the whole assemblage. He will thus be made to see the impossibility of studying any form successfully out of relation to the other forms—the necessity for taking a comprehensive survey of the whole as a condition to a satisfactory understanding of any part. If one wishes to become acquainted with the black bass, for example, he will learn but little if he limits himself to that species. He must evidently study also the species upon which it depends for its existence, and the various conditions upon which *these* depend. He must likewise study the species with which it comes in competition, and the entire system of conditions affect-

ing their prosperity. Leaving out any of these, he is like one who undertakes to make out the construction of a watch, but overlooks one wheel; and by the time he has studied all these sufficiently, he will find that he has run through the whole complicated mechanism of the aquatic life of the locality, both animal and vegetable, of which his species forms but a single element. * * * * "I cannot too strongly emphasize the fact frequently illustrated, I venture to hope, by the papers of this series—that a comprehensive survey of our entire natural history is absolutely essential to a good *working knowledge* of those parts of it which chiefly attract popular attention—that is, its edible fishes, its injurious and beneficial insects, and its parasitic plants. Such a survey, however, should not stop with a study of the dead forms of nature, ending in mere lists and descriptions. To have an *applicable* value, it must treat the life of the region as an organic unit, must study it *in action*, and direct principal attention to the laws of its activity."

Prof. Forbes believes, from results so far obtained, that it will prove to be a rule "that a fish makes scarcely more than a *mechanical* selection from the articles of food accessible to it, taking almost indifferently whatever edible things the water contains which its habitual range and its peculiar alimentary apparatus enable it to appropriate, and eating of these in about the ratio of their relative abundance and the ease with which they can be appropriated at any time and place. If this is so, knowing the structure of a fish and the contents of a body of water, we shall be able to tell, *a priori*, what the fish will eat if placed therein."

Insect Enemies of the Rice Plant.—In the October number of the *American Entomologist* (Vol. III, p. 253), we published an interesting communication from Mr. John Screven, of Savannah, Ga., addressed to Dr. J. L. LeConte, regarding insects injurious to the rice plant. We then referred the Scarabæid larva (or "grub") which feeds upon the roots provisionally to the genus Ligyrus, being led to this conclusion by the circumstance that a species of this genus (*L. rugiceps* Lec.) attacks, in a similar way, the roots of sugar cane in the south, and that another species (*L. relictus* Say,) which is common farther north, has been observed feeding on the roots of wild rice in the marshes bordering Lake Erie. Meanwhile Mr. Screven kindly sent us specimens of the perfect insect, which proves to be a closely related form, *Chalepus trachypygus* Burm. This beetle occurs through the whole extent of the Southern States, and is very common along the edges of the swamps, in the pine barrens and in similar moist grassy places, feeding both in the larva and imago states on the roots of grasses.

Of the second species attacking the roots of rice, the "maggot" of Mr. Screven (see *Am. Ent.* III. p, 262–3), no perfect insects

have been received yet, but renewed examination of the larva seems to confirm our opinion previously expressed (l. c. p. 253), viz: that it is a Cerambycid allied to Oberea. If so, the species in question is possibly *Spalacopsis suffusa* Newm., which is by far less rare in the Southeast than is generally supposed. The perfect insect occurs in large numbers, in June and July, in very wet grassy places, its larva doubtless boring in the stems or roots of grasses which are more or less covered with water. The beetle, however, is very liable to be overlooked even by an experienced collector, as when approached it "plays possum" and is then almost undistinguishable from a piece of dry grass.

The "water weevil" mentioned by Mr. Screven as injurious to rice we conjecture to be a species of Centrinus (perhaps *C. concinnus* Lec.?) or of an allied genus of the Barini group, as several species thereof occur in great numbers in wet, grassy places in the South, and as the larvæ of this group are known to live in the roots or stems of plants.

In this connection we would finally call attention to the reported recent appearance of a formidable insect enemy to the rice plant in the East Indies. Mr. Wood Mason, deputy superintendent of the India Museum has identified it as belonging to the genus Cecidomyia, which genus "has never before been found in India," and proposes the name of *C. oryzæ*, for the species, which threatens to become very destructive to the rice crop.

Description of a New Species of Cynips.—*Cynips q. Rileyi*, n. sp.—The galls of this species have been accurately figured in the *American Entomologist*, Vol. III, p. 153, by Prof. Riley, who received them from North Bend, Ohio. In the only specimen I have, the twig on which the galls grow is three-sixteenths of an inch in diameter and the galls rise about one-fifth of an inch, but the specimen figured is apparently larger than mine. As Prof. Riley has remarked, the galls bear some resemblance to those of *C. q. punctata* B. The latter are, however, of a hard woody structure, while the former are of a cork-like consistence, and apparently quite destitute of woody fiber. As all the flies I have reared from these galls are females I think it will prove to be the one-gendered form of one of our many dimorphic species To this new and in many respects very interesting species I have given the name of my esteemed fellow-laborer in this interesting branch of entomology, and to whom I am indebted for the specimens described.

Galls. Abrupt, irregular swellings on the twigs of *Quercus castanea*; varying in size and form from round, pustule-like bodies, one-fourth of an inch in diameter, and containing a single larva to a confluent mass of galls an inch or more in length and half an inch in diameter and containing many larvæ. The larger ones sometimes nearly or quite encircle the twig. Externally they are covered with a smooth, healthy bark like the unaffected parts of the branch. Internally they are of a dense cork-like substance, which is inseparable from the enclosed larval cells.

Gall-fly. Head black, smooth and shining. Antennæ short, antennal joints

thirteen; 1st joint, short, thick, truncate, 2d, short, oval; in color both are of a dark amber; 3d joint equal to the two preceding taken together, color yellowish-brown; 4th to 13th inclusive, a dusky yellowish-brown. Face black; mandibles yellowish, with black tips. *Thorax* small. Mesothorax rises abruptly above the very narrow collare; it is smooth, shining, black and grooveless, but under a one-eighth magnifier presents a minutely crackled surface, with a few scattered white hairs. Scutellum smooth, rounded and separated from the anterior portion of the mesothorax by a broad, shallow and highly polished groove. Wings small, hyaline, veins dark brown, heavy; the subcostal uniform its entire length, areolet large, well defined; radial area long and narrow, open. *Legs* dark shining brown, with pale yellowish joints. *Abdomen* subpedicellate, smooth, black, polished; in dry specimens truncate by the insheathing of the last three segments within the others.

Length, .11. Length of wings, .11.

Described from 12 specimens, all females, in my collection.—*H. F. Bassett, Waterbury, Conn.*

THE "YELLOW FEVER FLY."—In the last number of *Psyche* (September, 1880), Dr. H. A. Hagen gives some references to a fly belonging to the genus *Sciara*, which has been dubbed the "Yellow Fever Fly," presumably, judging from the context of the article, because it has been observed to swarm more particularly during yellow fever epidemics. The larvæ of this genus of flies are well known to feed upon the humus in soils and other decaying vegetable matter, and it is more than probable that the conditions which favor the development of the yellow fever also favor the development of these flies. We certainly cannot conceive any other connection between the insect and the disease. Based upon a list of swarms of Diptera by Prof. Weyenburg in 1861, in which *Sciara* is not included, Dr. Hagen considers the appearance of this fly in swarms, as described by Dr. Ravenel in South Carolina, as new. We have frequently observed them in swarms sufficiently dense to appear, at a short distance, like smoke.

The following unpublished letter received by us, with specimens, from Mr. S. S. Rathvon, of Lancaster, Pa., nearly twelve years since (March 22, 1869), also refers to flies of this genus as recorded in the *American Entomologist* (1, p. 186):

"I enclose a quill containing some Dipterous insects, which I received a few days ago from a friend in Bethlehem, Pa. He says they came out of the cracks between the floor boards, in July, in one of the upper rooms of a new addition built to their seminary, in millions. He counted five thousand on a single window, partly flying and partly running up the panes of glass. What seemed remarkable to him was that not one was seen in any other part of the house. Whilst living the wings were iridescent, but after death they lose this color. Near the end of August, last year, I had a partition fence painted on my premises, when the whole surface became covered with millions of little flies, with iridescent wings, very similar to these, and perhaps the same species. I confess that I know nothing about their name or history, although I have often noticed them adhering to newly painted buildings during spring and summer. What are they?"

WAYS OF LIMENITIS BREDOWII.—Mrs. A. E. Bush sends from San Jose, Cal., the following account of the flight and habits of this beautiful butterfly:

They are warriors and seem to have a good deal of character. They alighted on the white or black oaks high above, and with the appearance of being on the alert, waited till a large yellow Papilio came in sight, when it was chased away, and Limenitis returned to his perch awaiting for the next fray. A smaller butterfly routed the Limenitis, however. They were shy of light colors. When I had on a light-colored dress I could not get near one, but with a brown dress they would alight on it, and about my feet. Throwing small pebbles, chips or rocks at them seemed to enrage them, and they would follow anything thrown at them back to the ground. A Grapta, on the contrary, was attracted by a white hat, and hovered around my head like a bee above the flowers, and would alight on the hat and on my hand.

HABITS OF XYLOTRECHUS CONVERGENS.—The larva of this Longicorn beetle infests what we call thorn apple or red haw; comes to maturity in one year, and the imago makes its appearance about the 15th of June. I have taken it as late as July 1st. It kills the tree in one year after the egg is laid in the crevices of the bark. As soon as hatched the larva enters the wood, and hardly travels six inches. I am the only one here who has taken it so far; I have taken twenty out of a piece of wood three feet long.—*M. J. Myers, Ft. Madison, Ia., in letter to Dr. J. L. LeConte.*

AN AQUATIC SPHINX LARVA.—In the same number of *Psyche* above referred to, is an interesting communication by Baron von Reitzenstein, of New Orleans, La., describing a sphinx larva belonging to the genus Philampelus, which he found feeding on the floating Nymphæa in the centre of a draining canal, the whole body, with exception of the thoracic segments, being submerged under water. The larvæ are described as swimming with great facility from one patch of plants to another.

ANTHROPOLOGY.[1]

EARLY MAN IN BRITAIN.—The latest utterance upon this subject is from the pen of the distinguished cave hunter, Prof. W. Boyd Dawkins, entitled, "Early Man in Britain, and his place in the Tertiary Period," published in London by Macmillan & Co. The subject is treated in the three-fold point of view of the geologist, the prehistoric archæologist, and the historian. Beginning with the earliest period during which man is alleged to have made his appearance, the author passes downward through time, or, what is equivalent, upward through the geological record to the prehistoric iron age. The Tertiary period is divided into six

[1] Edited by Prof. OTIS T. MASON, Columbian College, Washington, D. C.